

REMARKS/ARGUMENTS

This responds to the issues raised in the Official Action of June 3, 2008 and accompanies a Request for Continued Examination. Also filed concurrently with this Amendment is an Information Disclosure Statement that relates to a document cited and discussed in the remarks that follow.

The claims have been amended in order to more particularly point out and distinctly claim that which applicants regard as their invention. Claim 1 has been amended to specify that the alkyl group represented by R^1 , R^2 , R^3 and R^4 contains 1 to 4 carbon atoms. The significance of this change is discussed in the remarks that follow.

A general amendment has made to remove the "characterized in that" expression to replace it with --wherein--.

Claim Rejections 35 USC §112, paragraph 1

The Examiner is thanked for his acceptance of the claimed scope of variables Y, R^5 and R^6 of Formula 1. It is, however, submitted that the Examiner's rejection of the scope of R^1 , R^2 , R^3 and R^4 should also be withdrawn.

TEMPO, the sole compound of Formula 1 used in the present examples, has a methyl group at each of the positions corresponding to R^1 to R^4 of Formula 1. The claimed scope of each of R^1 to R^4 is C_1 - C_6 alkyl. However, in order to advance examination and direct the claims closer to the exemplified subject matter, claim 1 is above amended such that " R^1 , R^2 , R^3 and R^4 each independently stand for an alkyl group having 1 to 4 C-atoms...".

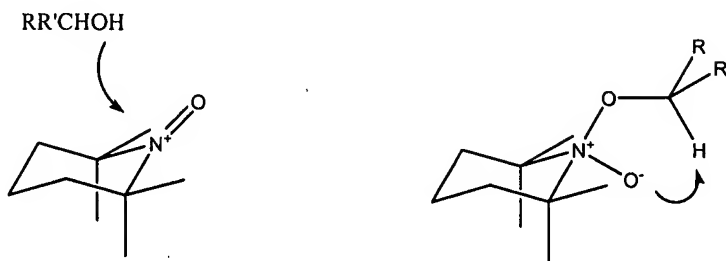
The following justification for the scope of R^1 to R^4 is directed to C_1 - C_4 alkyl as above.

i) The functionality across the scope of a C_1 - C_4 alkyl group is consistent; it is well-known to the skilled man that an alkyl group is generally itself unreactive, and that change in size of such a group does not greatly affect reactivity of a compound.

ii) The size of alkyl groups claimed is relatively narrow. It would not be expected that, for example, substitution of a methyl group of TEMPO for propyl would significantly alter the compound's solubility or reactivity.

iii) The position of the C_1 - C_4 alkyl group in the TEMPO derivative of Formula 1 defined in amended claim 1 is such that it would not sterically hinder the oxidation reaction. The mechanism of reaction of TEMPO in oxidizing a secondary alcohol is shown in Scheme 1 of

Anelli. Two further figures showing in full the geometry of TEMPO and a transition state of the reaction with an alcohol $RR'CHOH$ are shown below.



It can be seen that the methyl groups at the 2 and 6 positions of the piperidine ring do not sterically hinder the approach of the alcohol $RR'CHOH$, or the transition state of the oxidation reaction. It is also apparent that, if the methyl groups were replaced by C_2 - C_4 alkyl groups, these are unlikely to interfere with the reaction either.

iv) *Jenny* (US Patent Number 5,821,374) was granted with claim 1 directed to oxidation using a TEMPO derivative, wherein the positions equivalent to R^1 to R^4 are defined as “lower alkyl”. The exemplified derivatives in *Jenny* all possess only methyl at these positions. In that case the scope of the substituents wasn’t considered to be unreasonable. The present case is not considered to be different in this regard.

In view of the above, applicants consider that the skilled man would predict that if TEMPO itself works as a catalyst for a given oxidation reaction, a TEMPO derivative having C_1 - C_4 alkyl groups at positions R^1 to R^4 (in place of methyl) would also work.

Claim Rejections 35 USC §103(a)

The Examiner maintains his rejection of obviousness of the claims over *Jenny*. Applicants disagree. *Jenny* concerns the oxidation of primary and secondary alcohols using TEMPO as a catalyst.

The present application concerns the oxidation of 2,2-dimethyl-1,3-dioxolane-4-methanol (solketal). This alcohol is notoriously difficult to successfully oxidize to the resulting aldehyde (solketaldehyde). As presented in the response to the previous Official Action, *Ermolenko et al* were unable to carry out the oxidation. The Examiner raises the question as to whether TEMPO itself failed or whether the techniques of *Ermolenko et al* failed.

However, it should be noted that the authors were able to carry out the oxidation using PCC successfully. Any failure in their methods is merely supposed by the Examiner.

The teaching of *Ermolenko* as prior art remains quite clearly that oxidation by TEMPO (and also Swern, Dess-Martin periodinane and Ley perruthenate) failed, and that oxidation by PCC was successful. *Ermolenko* therefore teaches away from the present invention.

The fact that the above oxidation methods failed in *Ermolenko* illustrates that the substrate is particularly difficult to oxidize. The reason for this is that the product solketaldehyde is unstable, often forming by-products due to, for example, racemisation; condensation (for instance Aldol condensation) on the alpha hydrogen; cleavage of the isopropylidene group and concomitant oligo/polymerization; overoxidation towards acid and concomitant ester formation. One example of the latter is in fact shown in *Ermolenko*. Solketaldehyde has in the literature been named "stress aldehyde."

*Hollingsworth*¹, cited herewith, discusses the instability of 2, 3-O-alkylidene acetals of glyceraldehydes. In particular, *Hollingsworth*, at page 4272, left hand column, notes the ease of loss of stereochemical integrity, "especially under mildly basic conditions". The acetal group is also unstable in acidic media. Common transformations are shown in Scheme 4 but oxidation of an alcohol in the presence of the acetal moiety is not shown. Accordingly, particular sensitivity of the acetal protected glyceraldehyde is shown. Specifically, it would not be obvious, in view of this disclosure to use mildly basic conditions for the oxidation of solketal; the presence of a base being a requirement of present claim 1.

In summary the skilled man would not expect that the produced solketaldehyde would survive the reaction conditions of oxidation by TEMPO. Accordingly, the method of present claim 1 is not obvious.

For the above reasons it is respectfully submitted that the claims of this application are fully enabled and define inventive subject matter. Reconsideration and allowance are solicited. Should the examiner require further information, please contact the undersigned.

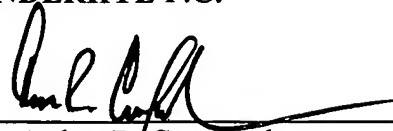
¹ *Hollingsworth & Wang*, Chem. Rev. (2000) 100, 4267-4282 – see the concurrently filed IDS.

QUAEDFLIEG et al
Appl. No. 10/576,447
November 20, 2008

Respectfully submitted,

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